REMARKS

Applicants respectfully submit this response to the Office Action dated March 26, 2003. Claims 1-9, 11 and 13-20 are pending in the application with claims 11, 19 and 20 being under examination. Claims 1-9 and 13-18 stand withdrawn by the Examiner as being drawn to non-elected subject matter. By the above amendment, claims 1-9 and 13-18 have been canceled and claims 11 and 19 have been amended. Support for the above amendments can be found throughout the specification and claims as originally filed and no new matter has been added. Support for "antigen presenting cell expressing or pulsed with" can be found, for example, at page 76, lines 4-11. The above amendments are not to be construed as acquiescence with regard to the Examiner's rejections, and are made without prejudice to prosecution of any subject matter modified and/or removed by this amendment in a related divisional, continuation and/or continuation-in-part application. Favorable reconsideration of this application is respectfully requested in view of the above amendments and the following remarks.

Claims Rejected Under 35 U.S.C. § 112, first paragraph

Claim 20 stands rejected under 35 U.S.C. § 112, first paragraph, because the specification, while being enabling for a composition comprising a first component selected from the group consisting of a polypeptide of SEQ ID NO: 139, allegedly does not reasonably provide enablement for a composition comprising a first component selected from the group consisting of physiologically acceptable carriers and immunostimulants and a second component consisting of a polypeptide having at least 95% and 99% identity with the polypeptide of SEQ ID NO: 139. According to the Examiner, the specification is not enabled for polypeptides having at least 95% and 99% identity with the polypeptide of SEQ ID NO: 139 because it is allegedly unclear to one skilled in the art which amino acids of SEQ ID NO: 139 can be deleted or inserted or substituted to give rise to a polypeptide having 95% or 99% identity with SEQ ID NO: 139 while still retaining the activity of stimulating T-cells. The Examiner also rejects claims 19 and 11 under 35 U.S.C. § 112, first paragraph, as allegedly failing to disclose actual biological function of the polypeptide of SEQ ID NO: 139. The Examiner also asserts that the specification provides no working examples demonstrating enablement for use of the claimed polypeptides in stimulating

and/or expanding T-cells specific for a *Chlamydia* protein. The Examiner concludes that it would require undue experimentation to practice the invention as claimed.

Applicants respectfully traverse the stated grounds for rejection under 35 U.S.C. § 112, first paragraph. Applicants have demonstrated in the instant disclosure that the *Chlamydia trachomatis* CT875 protein, having an amino acid sequence set forth in SEQ ID NO: 139, reacts specifically with human $CD4^+$ T cells of Chlamydia-infected patients. This discovery by Applicants was made possible, as set forth in the specification as originally filed (*e.g.*, Examples 1 & 2; page 99, line 1 to page 103, line 29), by screening an expression cloning genomic library of *Chlamydia trachomatis* serovar E with *Chlamydia* specific T-cell lines that were generated by stimulating PBMCs of *Chlamydia* infected patients enrolled in Corixa Corporation's blood donor program. Briefly, a randomly sheared genomic library of *Chlamydia trachomatis* serovar E was constructed in Lambda ZAP II vector, plated out in 96 well plates and induced to express the insert *Chlamydia* proteins. After pelleting and resuspension, the induced bacterial suspension was transferred to wells which contained monocyte-derived dendritic cells. The dendritic cells were washed to remove free *E. coli*, and then screened using donor T cells. Positive pools were identified by measuring INF-γ production and proliferation of the T cell lines. One pool identified by this approach contained the clone referred to as E5-A8-85, which was found to contain the insert sequence set forth in SEQ ID NO: 34, encoding a large region of the C-terminal half of the *Chlamydia trachomatis* CT875 protein, the full length sequence of which is specifically set forth in SEQ ID NO: 139. Importantly, in order for CT875 to be identified using this expression cloning approach, *Chlamydia trachomatis* T cells specifically reactive against CT875 were necessarily present in the human donor T-cells used to screen the expression library. Therefore, the identification of CT875 using the approach disclosed by Applicants clearly demonstrates that CT875 is immunogenic and capable of stimulating T cells.

Further still, Applicants expressed recombinant CT875 protein (e.g., Example 4, page 106, line 11 to page 107, line 6) and used this recombinant protein to identify additional human donor T-cell lines reactive with CT875 (e.g., Example 5, page 107, line 9 to table ending on page 111). These studies clearly demonstrated that CT875 was immunorective in 8/11 human T-cell lines tested, unambiguously confirming the T-cell immunogenicity of this antigen.

In view of this disclosure by Applicants the skilled artisan would understand that CT875 was demonstrated to be a *Chlamydia* antigen effective for stimulating a *Chlamydia*-specific T-cell response in humans. The skilled artisan would further understand, in view of this disclosure, that sequences sharing a high degree of structural identity with SEQ ID NO: 139, e.g., sequence having at least 95% or 99% identity with SEQ ID NO: 139, would also be capable of stimulating T-cells specific for a *Chlamydia* CT875 sequence of SEQ ID NO: 139, as currently claimed. For example, the skilled artisan would understand that although SEQ ID NO: 139 represents a CT875 sequence identified by Applicants from *Chlamydia trachomatis* serovar E, CT875 polypeptides from other *Chlamydia trachomatis* serovars share a high level of sequence identity with SEQ ID NO: 139 and these highly related sequences, e.g., sequences having at least 95% or 99% identity with SEQ ID NO: 139, would be expected to exhibit a correspondingly high degree of immunological cross-reactivity with SEQ ID NO: 139. The skilled artisan would further expect, based upon Applicants' disclosure, that a sequence of SEQ ID NO: 139 could be modified using routine techniques to produce a polypeptide having at least 95% or 99% identity to a sequence of SEQ ID NO: 139, and that these related sequences would similarly retain a high degree of immunological cross-reactivity with T-cells that are specific for a polypeptide sequence of SEQ ID NO: 139. These expectations on the part of the skilled artisan are submitted to be soundly based upon fundamental principles of immunological recognition and binding. In this regard, a precise disclosure regarding which specific amino acid residues of SEQ ID NO: 139 can be modified while retaining the ability to stimulate T cells specific for an amino acid sequence of SEQ ID NO: 139 is simply not necessary in this instance for a skilled artisan to practice the claimed invention when it would be well understood, in view of the instant disclosure, how to make and use the claimed sequences having at least 95% or 99% identity with SEQ ID NO: 139, and how to determine whether the T-cells elicited by such sequences are cross-reactive with an amino acid sequence of SEQ ID NO: 139.

One of skill in the relevant art would in further appreciate that there are a multitude of standard, art-recognized assays which one would use in order to confirm whether an immunogenic portion of a polypeptide having at least 95% or 99% identity with a polypeptide sequence of SEQ ID NO: 139 would be capable of stimulating a T cell response cross-reactive

with a sequence of SEQ ID NO: 139 (e.g. page 66, line 19 to page 67, line 16). These well known assays include, by way of illustration, T cell proliferation assays and IFN-gamma production assays. Applicants submit that the use of such methods amounts merely to routine screening and that such methods most certainly do not require undue experimentation.

Accordingly, as polypeptides having at least 95% or 99% identity with SEQ ID NO: 139 would be understood to be capable of being made and used for stimulating T cells retaining specificity for the CT875 sequence of SEQ ID NO: 139, and as this would be well recognized as such by an artisan of ordinary skill, Applicants respectfully submit the claimed invention is indeed fully enabled by the specification as filed and could be practiced without undue experimentation and with a reasonable expectation of success. Reconsideration and withdrawal of the rejections under 35 U.S.C. § 112, first paragraph, are thus respectfully requested.

Claims Rejected Under 35 U.S.C. § 112, second paragraph

Claims 19-20 and 11 stand rejected under 35 U.S.C. § 112, second paragraph, as allegedly being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regard as their invention. More particularly, the Examiner views as vague the recitation in claim 19 of the phrase "T-cells specific for a *Chlamydia* protein" on the basis that the claim does not recite that the T-cells are contacted with a *Chlamydia* protein. The Examiner also considers vague Applicants' recitation in claim 19 of "at least an immunogenic portion" on the basis that it is not clear which portion of a polypeptide is immunogenic. The Examiner also considers vague Applicants' recitation in claim 19 of the phrase "and/or" because it is allegedly not clear how to stimulate and expand T-cells by contacting T-cells with a polypeptide. Finally, the Examiner also rejects claims 19 and 11 under 35 U.S.C. § 112, second paragraph, as being incomplete for allegedly omitting essential steps, on the basis that there is no step which correlates contacting T-cells with a composition and stimulation and/or expansion of T-cells. According to the Examiner, the claims are drawn only to contacting T-cells with a composition and that, further, there is no step for measuring stimulation and expansion of T-cells.

Applicants respectfully traverse this rejection and request reconsideration on the following grounds.

With respect to the phrase "T-cells specific for a *Chlamydia* protein", Applicants respectfully submit that the skilled artisan would have no difficulty understanding that the "T-cells specific for a *Chlamydia* protein" are T-cells specific for the *Chlamydia* protein having a sequence set forth in SEQ ID NO: 139, since this is in fact the amino acid sequence of the *Chlamydia* CT875 polypeptide of SEQ ID NO: 139 that is specifically set forth in the claims as being contacted with T-cells. Nevertheless, for purposes of clarity and to advance prosecution of the subject application, Applicants have amended claim 19 such that the T-cells stimulated according to the claimed invention are "T cells specific for a *Chlamydia* CT875 protein having the amino acid sequence set forth in SEQ ID NO: 139."

With respect to the Examiner's assertion that the phrase "at least an immunogenic portion" is vague on the basis that it is not clear which portion of a polypeptide is immunogenic, Applicants respectfully submit that the skilled artisan would understand the metes and bounds of this phrase in the context of the currently claimed invention. Indeed, extensive guidance is provided by the specification as filed with regard to making and using immunogenic portions according the claimed invention (e.g. page 66, line 19 to page 67, line 16). Applicants further submit that the skilled artisan need not know which specific portions of a CT875 protein are T-cell immunogenic in order to understand with clarity the scope of the invention claimed, how to practice the claimed method, and how to determine whether T-cells elicited by a claimed polypeptide are cross-reactive with an amino acid sequence of SEQ ID NO: 139.

With respect to the Examiner's assertion that it is not clear how to stimulate and/or expand T-cells by contacting T-cells with a polypeptide, Applicants respectfully submit that the skilled artisan, in view of the instant disclosure, and further in view of what is well known and established in the art, would understand the claimed invention. It is well known in the art of immunology that T-cells may be stimulated by contact with an immunogenic portion of an antigen, wherein the portion is presented to the T-cells in the context of an antigen presenting cell. Accordingly, the skilled artisan would understand, in the currently claimed invention, that reference to contacting T-cells with an immunogenic portion of a polypeptide of SEQ ID NO:

139 necessarily requires that the portion be presented to the T-cells in an appropriate context, such as in the context of an antigen presenting cell. For purposes of clarity, and without prejudice, Applicants have amended claim 19 such that the T cells are contacted with an antigen presenting cell expressing or pulsed with at least an immunogenic portion of a polypeptide of SEQ ID NO: 139, or a polypeptide having at least 95% or 99% identity with a polypeptide of SEQ ID NO: 139. Support for this amendment can be found, for example, at page 76, lines 4-11, and elsewhere throughout the specification as originally filed.

With respect to the Examiner's assertion that claim 19 omits essential steps as there is no step correlating contacting T-cells with a composition and the stimulation and/or expansion of T-cells, Applicants have amended claim 19, without prejudice or acquiescence, to include the phrase, "and thereby stimulating and/or expanding T cells specific for a *Chlamydia* protein having the amino acid sequence set forth in SEQ ID NO: 139."

The Commissioner is authorized to charge any additional fees due by way of this Amendment, or credit any overpayment, to our Deposit Account No. 19-1090.

All of the claims remaining in the application are now believed to be in condition for allowance. Favorable consideration and a Notice of Allowance are earnestly solicited.

Respectfully submitted,

Ajay Bhatia et al.

SEED Intellectual Property Law Group PLLC

Julie Ingvall 30,461

Jeffrey Hundley, Ph.D., Patent Agent
Registration No. 42,676

Enclosure:
Postcard

701 Fifth Avenue, Suite 6300
Seattle, Washington 98104-7092
Phone: (206) 622-4900
Fax: (206) 682-6031
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